CRIM
CENTRE DE RECHERCHE INFORMATIQUE DE MONTRÉAL
ANNUAL REPORT 2009-2010

VISION | IMAGING | INTEROPERABILITY | TESTING | DEVELOPMENT | SPEECH RECOGNITION | AUDIO-VISUAL INDEXING | HUMAN/COMPUTER INTERACTION | MODELLING | COLLABORATION | TRAINING | TECHNOLOGY TRANSFERS | SEMANTIC ANALYSIS OF CONTENT

CRIM

CRIM'S MEMBERS AS
at May 31, 2010

63 SMALL BUSINESSES

Abbott Laboratories (Div. Point of Care)
Agfa
Amadeus, a Division of DECIMAL
Analystik
AudiSoft Technologies
Boreal Informations Strategies
Brio Conseils
CEDROM-SNi
CGSI@Solutions TI
CODE6
*COGEP
Conception Interal
Complys technologies
Copernic
eSpace
eVision
Famic Technologies
Fédération nationale des enseignantes et des enseignants du Québec
Gardien Virtuel
GCI
Groupe Ultima
GEO-3D (dba Trimble Canada)
INFORMAT Software
Ingenio, filiale de Loto-Québec
Irosoft
IT&Labs Canada
K3 Média
Keal Computer Services
KEOPS Technologies
Logibec Groupe Informatique
Matricis Informatique
MédiaMed Technologies
Nosotech
OKIOK
Omega Optimisation
Omnitech Labs
Optimum Conseil
Optometrics Services
PG Solutions
PHD Medical
Posera Software
Pretty Objects Computers
Purkinje
Pyxis Technologies
QuadraMed Corporation
QualiTI7 Conseil
Radio IP Software
R3D Consulting
Santématique, Logiciels Sys-Thèmes
ScriptLogic Corporation
SIA Service Informatique Access
Silex Créations
SIR Solutions
Socami
SOVO Technologies
Super Points Canada
Swing Cam Ltd. – DBA FingerWorks Telestrators
Symantec (Canada) Corporation
Technology Evaluation Centers (TEC)
Technomedia Formation
TechnoMed Solutions
Voxco
XWAVE

20 MAJOR CORPORATIONS

Bombardier Transportation (Div. CoC SWE)
Canadian Space Agency
Dessau
DMR
Fédération des Caisses Desjardins du Québec
Groupe TVA
Hydro-Québec
La Capitale Financial Group
LGS Group
National Bank Financial Group
National Film Board of Canada
SAP Labs Canada
SAQ – Div. Ressources informationnelles
SITA Canada –Aircraft communications
SSQ Financial Group
Staples Avantage Canada
*Sysmex Canada
Ubisoft Divertissements
Ville de Montréal

48 ASSOCIATE MEMBERS

Agence de la santé et des services sociaux de Montréal
Alliance numérique
Applied Science Center for Innovation and Excellence (COIE)
Association québécoise d'établissements de santé et de services sociaux
Canistix
CEFRIO
Chambre de commerce française au Canada
Concordia University
Conseils Atelya
CREPUQ
CRIQ
DigiPlan TEC
DocuLibre
Elfiq Networks
Emergensys Solutions
Fédération des cégeps
Feeling Software
Grégoire Perron, Avocats
HumanIT
Inno-centre
Investissement Québec
La Fringale
Les Solutions Victrix
LS Canada
MaZone Télécom
MétricaSoft
Ministère de la Santé et des Services sociaux
Ministère de l'Emploi et de la Solidarité sociale
Ministère des Affaires municipales, Régions et de l'Occupation du territoire
Montreal IT Institutes
Mouvement québécois de la qualité
Pôle universitaire des Basses-Laurentides
Quebec Federal Council in Information Technology
Québec Photonic Network
Quebec Technology Association
Réseau ACTION TI
Réseau des ingénieurs du Québec
RISQ – Réseau d'informations scientifiques du Québec
Société générale de financement du Québec
Sogique
Sous-Traitance Industrielle Québec
TechnoCompétences
TechnoMontréal
Technopôle Defence & Security
The French-speaking University Agency (AUF)
Valotech
Voix des Entrepreneurs en T.I. de Québec
Yu Centrik

9 ACADEMIC MEMBERS

Collège Ahuntsic
École de technologie supérieure
HEC Montréal
McGill University
Université de Montréal
Université de Sherbrooke
Université du Québec à Montréal
Université du Québec à Trois-Rivières
Université Laval

1 EX-OFFICIO MEMBER

Ministère du Développement économique, de l'Innovation et de l'Exportation (MDEIE)

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*Membership expired as of December 2009

MISSION

CRIM is an Information Technologies applied research centre that develops and transfers technologies and knowledge in order to add value to the products and services of businesses and organisations and contribute to their commercialisation.

CRIM

- Develops and transfers technologies to businesses through a wide range of applications designed to improve their productivity, competitiveness and processes
- Steers innovation projects with partners from the academic and business communities
- Carries out world calibre applied research projects in: speech recognition, vision and imaging, and the analysis of distributed systems
- Provides specialised training
- Conducts software tests and endorses projects relating to the strategic support, evaluation and assimilation of best practices
- Fosters the cultivation of Information Security
- Organises scientific and technological events

CRIM IN NUMBERS
2009-2010

RESEARCH AND DEVELOPMENT

4 teams

35 lead researchers, researchers, advisors and research agents

15 scholarship recipients and interns

35 publications

Breakdown of 123 research and development projects:
- Technological guidance: **36**
- Exploratory research: **16**
- Precompetitive research: **3**
- Industrial research: **63**
- Other projects: **5**

NETWORK

141 members:
- **63** small and medium enterprises (SMEs)
- **20** large corporations
- **9** universities
- **48** associate members
- **1** ex-officio member

84 regular employees

TRAINING AND KNOWLEDGE TRANSFERS

2,047 individuals trained

50 expert trainers

204 course titles

553 training sessions

37 new courses

EVENTS

616 people attended CRIM's Crystal Ball conference

7 seminars, workshops and conferences:
- **R&D seminar:** intelligent video surveillance for individual and property security
- **Learn n' Lunch:** SharePoint 2010: what's up, doc?
- **Midi-conférence:** ITC and sustainable development
- **Journée Carrière Tehcno:** ITC professions serving people
- **Alfresco symposium:** effective corporate information management
- **Symposium GED:** electronic document management (EDM)
- **WOPR 14 workshops:** performance and reliability

CONTRIBUTIONS AND PARTICIPATION

26 service agreements, cross-memberships, courses, etc.

20 staff members participated as speakers or panellists

16 staff members made contributions as committee members, invited professors, etc.

CHAIRMAN'S MESSAGE

2009-2010 was full of changes for CRIM. Two major transitions relating to the refocusing of our operations were particularly noteworthy. First, there was a changing of the guard within the organization's management team. Second, CRIM relocated to a modern complex of offices and laboratories.

Following 13 years as President and CEO, Yves Sanssouci left CRIM in late 2009 to begin his well-deserved retirement. Taking over from him was Daniel Blanche, who brings invaluable strategic positioning and marketing expertise. Daniel took up his new duties on January 11, 2010. In addition, 2009 ended with CRIM's large-scale move from downtown Montreal to the Parc Extension district. Our new premises are modern and user-friendly and meet the needs of our research teams.

The global economic context remains precarious. Nevertheless, CRIM concluded a subsidy agreement with the Quebec Department of Economic Development, Innovation and Export Trade (MDEIE), which will provide annual funding of nearly $5.8 million over the next four years.

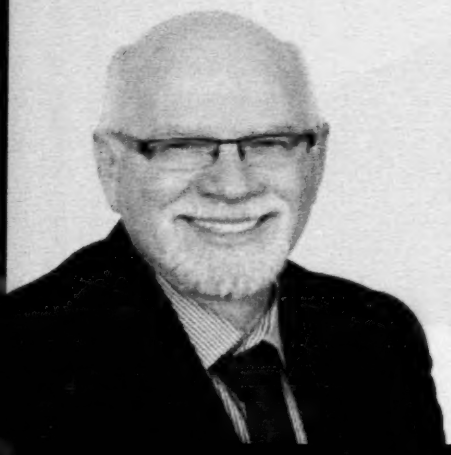
With Daniel Blanche at the helm, we have undertaken a repositioning aimed at demonstrating our specific expertise. The 2008-2013 business plan was also reviewed and updated in order to better reflect certain data and change factors and to analyze our business environment.

CRIM's science committee met in November 2009 to evaluate the organization's R&D activities. Once again, the committee's report was very positive, particularly as regards the choice of research areas and our teams' scientific projects.

Various glimmers of good news enabled us to stay optimistic and look to the future with confidence. For example, the MDEIE will be providing $2.2 million in financial assistance to upgrade our R&D IT equipment under the research support program. In addition, SOVO Technologies Inc., one of CRIM's spin-off companies, became a stand-alone commercial entity. Furthermore, the Laval School Board and CRIM won an OCTAS 2010 award in the "Business Solutions and Internal Development" category for the Solutionneur, a tool used to automate the creation of master schedules for secondary schools.

The year drew to a close with a very promising outlook. Our prospects, however, will only be realized if all of CRIM's members, partners and clients come together in support of our efforts. In this regard, I would like to express my gratitude to my colleagues and the Board members, who support and promote the organization, in addition to the members of the management team, who enable CRIM to keep on setting the gold standard for IT in Quebec.

In closing, I would like to express my special thanks to all of CRIM's staff, who help to promote the organization day after day and year after year. We should all take pride in the fact that CRIM is celebrating its 25th anniversary in 2010. May CRIM live long and prosper!



Marc-André Roy

◀ Alan DeSousa, mayor of Saint-Laurent – Vincent Chiara, president, Mach Group – Mary Deros, City Councillor for the Parc-Extension district – Alain Paquet, Member for Laval-des-Rapides Quebec Liberal Party Parliamentary assistant to the Premier Chair of the Committee on Public Finance – Anie Samson, mayor of Villeray-Saint-Michel-Parc-Extension – Daniel Blanche, CRIM's CEO – Marc-André Roy, CRIM's Chairman of the board.

PRESIDENT AND CEO'S MESSAGE

I was appointed President and CEO of CRIM shortly before the organization celebrated its 25th anniversary. I took up my duties in January 2010, approximately halfway through the fiscal year. I am proud to be associated with such a unique organization and I quickly became familiar with its multiple facets. It should be noted that CRIM is one of five liaison and transfer centres designated by our primary financial partner, Quebec's Department of Economic Development, Innovation and Export Trade (MDEIE).

To meet the expectations of CRIM's Board, we analyzed our activities, taking into account a number of key factors (e.g. positioning, innovation level and good governance) in association with the management committee. In March 2010, we proceeded to refocus our operations and revamp CRIM's organizational structure.

To those ends, we have repositioned our core activity—R&D—as our central focus. Since it is recognized for its applied research, CRIM must maintain its upstream position by continuing to develop its enabling technologies. We must also maintain our technological advantage in order to differentiate ourselves from the numerous offers available within Quebec's IT market.

In addition, in order to maximize the transfer of technological knowledge to its members and to the IT community, CRIM will continue to optimize its two other core activities: the IT training and transfer centre (CFT) and the software testing and interoperability centre (CTLI).

This restructuring process has required very tight financial management and extensive efforts by all staff members. In addition, steps have been taken to manage CRIM's risks more effectively.

By developing an effective and adapted innovation model, CRIM is fulfilling its mission and expanding the ways in which it uses advanced technological platforms and a technological toolbox to bring the benefits of applied research to companies positioned to innovate and excel, thereby ensuring commercial success.

More than ever, CRIM's actions favour the transfers of its IT applications to industry, in addition to transfers of knowledge and expertise. Over 120 projects have been carried out in corporate settings, while more than 2,000 individuals have taken the CFT's courses.

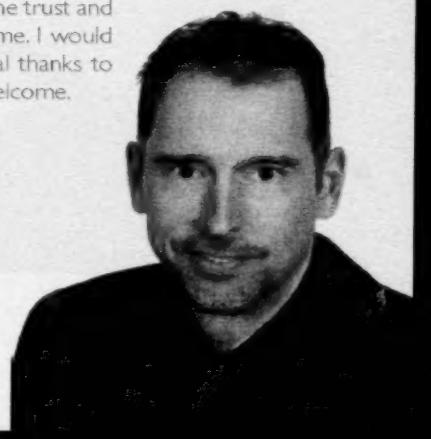
The past year included a number of highlights. In June 2009, the Quebec Information Security Institute (ISIQ) became autonomous. In September, CRIM submitted a brief in connection with the updating of the Government of Quebec's research and innovation strategy. When a potential flu pandemic was announced in November, CRIM adopted a service continuity plan aimed at mitigating any adverse effects. In late 2009, SOVO Technologies Inc. was created, while CRIM relocated to a brand-new office complex.

More good news arrived in February 2010, when the MDEIE granted $2.2 million in funding assistance for CRIM's research infrastructure. In April, the Crystal Ball conference brought together more than 600 participants and 25 guest speakers from Canada, the US and Europe.

In the spring of 2010, we inaugurated our new facilities at a ceremony attended by representatives of the Government of Quebec and the City of Montreal, together with CRIM members, clients and partners.

Capping off our efforts and expertise in developing promising technologies, the Laval School Board and CRIM won an OCTAS 2010 award for their Solutionneur project!

In closing, I would like to thank the Board members and the management committee for the trust and support they have placed in me. I would also like to express my special thanks to CRIM's staff for their warm welcome.



Daniel Blanche

BOARD OF DIRECTORS

Mr. Yves Beauchamp (Vice Chairman)
Managing Director
École de technologie supérieure

1. **Mr. Daniel Blanche, MBA, ICD.D**
(as of January 2010)
President and CEO
CRIM

2. **Mrs. Lyne Bouchard**
Vice-President, Longueuil Campus and Vice-President, information technologies
Sherbrooke University

3. **Mrs. Louise Cardinal**
President and CEO
TechnoMed Solutions, a Brookfield Asset Management Company

4. **Mr. Claude-Yves Charron**
Vice-Rector, Academic Services and Technological Development
Université du Québec à Montréal

5. **Mr. Jan Czech (Past President)**
President
J C Consultants

6. **Mrs. Josée De La Durantaye**
President
Optima Management

7. **Mr. Robert Gérin-Lajoie**
Directeur du Bureau de l'environnement numérique d'apprentissage
Université de Montréal

8. **Mr. Benoît Godbout**
Vice-President, Chief Technology Officer
Copernic

Mr. Pierre-François Isabel
Chief of Technology
Voxco

9. **Mr. Michel Jarry**
CEO
Omega Optimisation

Mrs. Marie Lapalme
President
AudiSoft Technologies

10. **Mr. Alain Lavoie**
President
Irosoft

11. **Mr. Daniel D. Lemay**
Chef de division, Applications des domaines corporatifs
Direction des systèmes d'information
Ville de Montréal

12. **Mrs. Marie-Josée Lizotte**
Directrice de l'innovation et du transfert
Ministère du Développement économique, de l'Innovation et de l'Exportation (MDEIE)

13. **Mr. Michel Martel**
President
Analystik

14. **Mr. Gilles Mourette**
President and Chief Executive Officer
SSQ, General Insurance

15. **Mr. Yves Pelletier**
Senior Vice-President, Business Development
DMR

16. **Mrs. Francine Riel**
Assistant to the President & CEO
CRIM

Mrs. Marie Rochefort
Management Executive, Expertise, Networks Analysis and Management
Hydro-Québec (IREQ)

17. **Mr. Marc-André Roy (Chairman)**
President and CEO
R3D Conseil

Mr. Yves Sanssouci, MBA
(June to December 2009)
President & CEO
CRIM

Mr. Philippe Turp
Director, Strategic Development and Institutional Relations, Ubisoft Campus
Ubisoft Divertissements

MANAGEMENT COMMITTEE

1. **Mr. Daniel Blanche**, MBA, IAS.A
President and Chief Executive Officer

2. **Mr. Pierre Dumouchel**, Ph.D.
Scientific Vice-President

3. **Mrs. Gisèle LaRue**
Vice-President, Training Centre

4. **Mr. Jacques Ouellet**
Senior Vice-President, R&D and Commercialization

5. **Mrs. Francine Riel**
Assistant to the President & CEO

6. **Mr. Claude Robitaille**, CHRP
Director, Human and Material Resources

7. **Ms. Suzanne Tremblay**, CMA
Director, Finance Department and Information Systems

APPLIED RESEARCH CENTRE

The past year also provided additional opportunities for us to reaffirm the key role that CRIM's R&D activities play in public and private-sector organizations of all sizes. CRIM's applied research focuses on commercially viable solutions, based on an approach that emphasizes collaborative innovation. The importance of our role confirms that our research areas are fully aligned with market trends. In addition, 2009-2010 provided us with opportunities to refine our offer and to enhance our technological toolbox in accordance with businesses' needs by providing competitive, marketable and profitable value-added for their products. The year's main highlights included the following:

Jacques Ouellet,
Senior Vice-President, R&D and Commercialization

SOVO TECHNOLOGIES – A CRIM SPIN-OFF

SOVO Technologies Inc. was officially incorporated on December 15, 2009. The team has been headed by Serge Forest since April 29, 2010. **SOVO** offers live and delayed closed captioning services. In addition, the new company provided closed captions for the 2010 Winter Olympics. For that occasion, 27 captioners were trained to produce 745 broadcast hours of live closed captioning over a 17-day period. CRIM will continue to play a key role in the evolution of SOVO's technologies.

▲ Christian Giroux, Senior Vice-President, Quebec City office, DMR-Fujitsu Consulting; René Marquis, Director of IT, School Organization and Transportation (IOST), Laval School Board; and Stéphane Bond, Advisor, Development and Internet technologies, CRIM.

LAVAL SCHOOL BOARD AND CRIM WIN AN **OCTAS 2010** AWARD

The **Laval School Board,** in association with CRIM, won an **OCTAS** award in the "Business Solutions and Internal Development" category (more than 2,000 employees) for its Solutionneur project; the gala award ceremony was held on May 28, 2010. Created by the development and Internet technology team, the Solutionneur is used to automate the creation of master schedules for secondary schools, a highly complex task that was formerly done by hand.

NOTEWORTHY PERFORMANCES !

CRIM's vision/imaging and Speech Recognition teams took part in the **National Institute of Standards** and Technology's **TRECVID 2009** evaluation campaign concerning video copy detection. Out of 42 results submitted by 13 international R&D labs, CRIM came in first place (for detection performance) by providing a combined analysis of the video's visual and audio content. CRIM also came in first on tests on which only the soundtrack was pirated (out of 12 results submitted by five labs) and came in ninth place out of 64 results submitted by 20 labs when only the videotape was pirated.

Daniel Blanche, CEO, CRIM; Gerry Sklavounos, MNA for Laurier-Dorion; Jacques Ouellet, Senior Vice-President, R&D and Commercialization, CRIM.

FINANCIAL ASSISTANCE FOR CRIM'S RESEARCH INFRASTRUCTURE

The **MDEIE** awarded a grant of $2.2 million to CRIM under phase two of the research support program (support for research infrastructure financing). The MNA for Laurier-Dorion, **Gerry Sklavounos**, representing Clément Gignac, **Minister of Economic Development, Innovation and Export Trade**, announced the good news at a press conference on February 23, 2010.

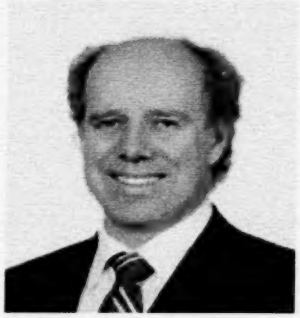
Développement économique, Innovation et Exportation
Québec

SCIENCE COMMITTEE PAYS TRIBUTE TO THE QUALITY OF CRIM'S R&D ACTIVITIES

Every two or three years, CRIM's R&D activities are evaluated by the science committee (this year's evaluation was carried out on November 24-25, 2009). Overall, the committee's findings were very positive in terms of CRIM's efforts to promote the results of its research in Quebec and the quality of its international scientific contributions.

In paying tribute to CRIM's excellent work, the committee members cited the comments of clients who described themselves as very satisfied with CRIM's services. In addition, the students whom CRIM welcomes as scholarship holders or interns appreciate being able to pursue their academic research in a stimulating environment that is focused on businesses' needs.

As the committee stated clearly in its report, "CRIM is one of the few organizations to successfully fulfil the difficult double role of developing and transferring technology."



Pierre Dumouchel, Ph.D.
Scientific Vice-President CRIM, Professor, Department of Software Engineering and Information Technology, ETS

1. **Roland Kuhn**, Research Officer
Interactive Language Technologies
NRC Institute for Information Technology (Canada)
2. **Robert Laganière**, Associate Professor
School of information technology and engineering
University of Ottawa (Canada)
3. **Luigi Logrippo**, Professor
Département d'informatique et d'ingénierie
Université du Québec en Outaouais (Canada)
4. **Mathieu Plourde**, Instructional Designer/Educational Technologist
LMS Project Leader, Instructional Services, IT-User Services
University of Delaware (USA)
5. **Christian Wellekens**, Emeritus professor (President of the Advisory Board)
Institut Eurecom Sophia Antipolis (France)

CRIM'S RESEARCH TEAMS AT WORK

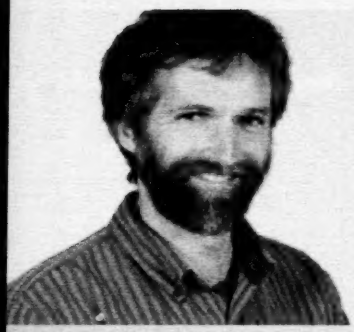
Langis Gagnon, Ph.D.
Lead Researcher and Director of the Vision and Imaging team

VISION AND IMAGING

The vision and imaging team pursued its collaboration with **Natural Resources Canada** on a study concerning shape recognition algorithms for automatic updates of hydrographic network-related information in their database. During the year, a software application was designed for potential integration within the **Sherbrooke Topographic Information Centre's** production environment.

In the past few years, the team has developed expertise in the area of intelligent video surveillance, particularly on projects involving **VideoWave Networks**. These projects are still generating interesting benefits. The publication of a business intelligence report on the topic led to the creation of a course administered by CRIM's IT training and transfer centre. In addition, a number of software components created to automatically monitor people and vehicles in a surveillance context were successfully reutilized in the sports field to monitor speed skaters as well as hockey and football players.

As part of its efforts to develop assisted technologies based on automatic detection techniques, the team developed a positioning and synchronization software application for delayed closed captioning. The team's visual content indexing algorithms are used to detect landscape, faces and text. By combining the results of these detections, the software helps captioners to deliver a higher-quality production more efficiently.



Gilles Boulianne
Director, Speech Recognition team

SPEECH RECOGNITION

This year, the Speech Recognition team was particularly present on the international stage. The results obtained in the **2009 TRECVID** competition involving audio/video copy detection, the **2010 NIST SRE** competition involving speaker identity verification and the **Interspeech 2009** Emotion Challenge involving Speech Recognition of emotions demonstrate that the team has developed some of the world's leading technologies.

Of course, the team is also pursuing its projects in partnership with various local companies. Under the auspices of major 2008-2010 **PROMPT-Quebec** initiatives, CRIM signed an agreement covering a two-year multi-partner project focusing on the language learning software developed by Unima Software; the team's Speech Recognition software will be used to evaluate learners' performance. The other major project, financed under NSERC's INNOV program, involves automatic detection of advertising and will open up new markets for **Eloda** and **CEDROM-SNi**.

January 2010 marked the start of operations of SOVO Technologies Inc., which uses the STD Direct system developed at CRIM. Subsequently, SOVO carried out a closed captioning project for the **2010 Winter Olympics** and the **FIFA World Cup Championships**, thanks to the linguistic models that the Speech Recognition team created specifically for these events.

Robert Bolduc
Director, Development and Internet Technology team

DEVELOPMENT AND INTERNET TECHNOLOGIES (DETI)

The DETI team members reinforced their expertise in five key areas: collaborative applications, document management, e-learning, textual content analysis and resource allocation.

Together with the **CSN**, the team continued work on a project aimed at integrating the Liferay and Alfresco platforms and featuring a combination of collaboration and document management. The team also provided guidance to the **Quebec Bar** and **HEC Montreal School of Business** on selecting Alfresco. The team also reinforced its expertise in the field by being one of the first in Quebec to use Alfresco's record management functions with the **Quebec Ferry Operators Association (STQ)**.

The team began work on the third phase of a textual content analysis project in connection with a major initiative undertaken by the **Quebec Department of Natural Resources and Wildlife (MRNF)**. This project uses various natural language processing techniques developed at CRIM. Partnerships were also established to develop advanced web research functions based on thesaurus use.

In the area of e-learning, DETI helped to develop the OpenSyllabus course planner/editor with HEC Montreal, supported the implementation of the Sakai learning platform at the **University of Montreal**, helped develop an e-portfolio project with the Faculty of Medicine and provided an open-source SCORM player used by various companies and the **University of Delaware**.

Additional projects are underway with the **Laval School Board**, the **Quebec City School Board**, **Victoriaville Cegep**, Sherbrooke's innovation project (**Agora de l'innovation**) and hockey referees in the city of Richelieu. Another project with the Quebec Distance Learning Society (**SOFAD**) will test Liferay's potential as an e-learning platform.

Alexandre Petrenko, Ph.D.
Lead Researcher and Director of the Distributed System Analysis team

DISTRIBUTED SYSTEM ANALYSIS

Alexandre Petrenko, senior researcher and director of CRIM's distributed system analysis team, was appointed program committee co-chair for the 22nd edition of **ICTSS 2010**, an international conference on software and systems testing organized by the International Federation for Information Processing (IFIP), which will be held in Brazil in November 2010. The conference provides a forum for leading experts in the field to discuss new methods, concepts, theories, tools and to share their experiences.

In partnership with the software testing and interoperability centre, the team completed two feasibility studies on behalf of **Bombardier Transportation**, focusing on assistance with the development of a train simulator and with the testing of distributed systems by using combinatorial methods. Both studies concluded that these approaches are feasible; talks are being held with the company concerning additional work on these initiatives.

In parallel, the team continues to work with **Siemens** in the testing area. The project underway involves generating a test case based on a testing scenario represented as a sequence diagram.

SOFTWARE AND INTEROPERABILITY TESTING CENTRE

Martin Blouin
Operational Manager, Software and Interoperability Testing Centre

Mindful of the fact that quality assurance and testing are often neglected in the IT industry, CRIM created the software and interoperability testing centre (**CTLI**), which is operated by an experienced team and boasts robust infrastructure and a series of integrated tools. In several ways, the centre is unique and comparable to the "software as a service" distribution model. The CTLI provides a unique multi-user virtual testing environment that is accessible to the entire community of developers and software solution integrators. CTLI's mission is to provide affordably priced best practices and top-of-the-line tools adapted to companies' specific needs. It is designed to foster collaborative work on-site with clients or in outsourcing mode.

During the year, the CTLI team carried out a number of projects, including a feasibility study for **Bombardier Transportation**. In addition, a proof of concept was conducted in outsourcing mode with India. This project demonstrated that the lab's collaborative environment is available worldwide at low cost.

As part of Quebec's major healthcare initiative (**Dossier santé Quebec/DSQ**)—the province's largest software development project—DSQ components were imported and installed for potential interoperability component certification by the Department of Health and Social Services (MSSS).

To ensure that the Agile Laboratory reaches the widest possible audience, including CRIM members, a 45-day promotion was offered providing free use of the facility.

LABO AGILE

OUR RESEARCH TEAM MEMBERS ATTENDED A NUMBER OF INTERNATIONAL CONFERENCES, INCLUDING:

- **Narjès Boufaden**, researcher: **ISWC 2009** (International Semantic Web Conference), Washington, DC, October 2010.
- **Samuel Foucher**, researcher: **IGARSS 2009** (International Geoscience and Remote Sensing Symposium), Cape Town, South Africa, July 2009.
- **Alexandre Petrenko**, lead researcher: **ICST 2010** (International Conference on Software Testing, Verification and Validation), Paris, France, April 2010.
- **Vishwa Gupta**, researcher: **ICASSP 2010** (International Conference on Acoustics, Speech and Signal Processing), Dallas, Texas, March 2010.

IT TRAINING AND TRANSFER CENTRE (CFT)

Gisèle LaRue
Vice-President, IT Training and Transfer Centre

The CFT's year was full of changes and activities. As the first carbon-neutral training facility in Quebec, thanks to the collaboration of Montreal's metropolitan transportation agency (STM) and Planetair, the distribution of free mass transit passes to our 2,800 students proved very successful and served to boost mass transit ridership throughout 2009-2010.

More than 2,000 managers and IT specialists enrolled in 204 public training sessions, including 37 upstream. Approximately 40 new courses were offered in 2009-2010. In addition, three new courses were given by CRIM's experts in the areas of voice communication, intelligent video surveillance and web and social applications. The sense of loyalty and trust shown by the CTF's clientele is evidenced in the 96% satisfaction rate.

Mobilizing a team of 10 partners and 50 expert trainers, including a number of people from CRIM's R&D team, we have trained 78,851 individuals, who have acquired a wide range of knowledge and skills required to integrate IT within their practices. In particular, the courses and customized training sessions on certification, standards, methods and models were especially popular, as were those dealing with programming languages and web ergonomics.

Two partnership agreements were concluded with a view to sharing services and offering exclusive benefits. One was with the **Quebec Association of Independent IT Specialists (AQIII)**, while the other was with the Quebec Engineers Network (RIQ).

Gisèle LaRue is involved with **TechnoMontreal**'s workforce initiative. Bringing together various organizations and major corporations, this initiative provides a forum for various IT stakeholders in Quebec and organizes promotional activities for ITC careers.

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RÉSEAU DES INGÉNIEURS DU QUÉBEC

▲ Gisèle LaRue at the inauguration of CRIM's new headquarters (May 11, 2010).

EVENTS

THE ART OF BEING SEEN, KNOWN AND RECOGNIZED!

La Boule de cristal du CRIM | 2010

CRIM's Crystal Ball conference was a great success in terms of organizational visibility and networking. Despite the unfavourable economic context, the organizers staged a major event that remains one of Quebec's flagship IT forums. A total of 616 people attended, including 27 guest speakers from Quebec and elsewhere in Canada, in addition to the US and Europe. These speakers explored a number of cutting-edge topics, including mobility and social networks. The satisfaction rate of the event's participants was 89%. CRIM was fortunate to have the support of various partners, including **DMR-Fujitsu** and **TELUS** (Montreal, April 7 8, 2010).

CRIM also took part in the **IT-healthcare symposium** organized by the Quebec Association of Healthcare and Social Services Establishments (AQESSS). Demonstrations of CRIM's Agile Laboratory (testing and interoperability) attracted widespread interest. In addition, Quebec City's university hospital centre (CHUQ) carried out simulations of the Crystal-Net software application (computerized clinical files in an open-source software environment). **CRIM's 2009 IT healthcare award** was presented to CHUQ's Dr. Normand Brassard for his outstanding role in developing and integrating IT in the healthcare sector (Quebec City, October 1-2, 2009).

In addition, CRIM hosted **WOPR 14**, the 14th edition of the workshop on performance and reliability, organized around the theme of reliability testing heuristics. The workshop was attended by 22 specialists from companies such as Google, Microsoft, Alcatel, eBay, etc. (Montreal, April 22-24, 2010).

FESTIVAL EUREKA! LA SCIENCE MET LE NEZ DEHORS

The participation of CRIM's R&D team in the **Eureka Festival** was a success, with at least 60,000 visitors getting a chance to meet our research specialists. Our team also demonstrated their expertise in the areas of visual/Speech Recognition and closed captioning. The festival, organized by the **Montreal Science Centre**, was designed to raise public awareness of science's multifaceted nature (Montreal, June 12-14, 2009).

LES JOURNÉES CARRIÈRES TECHNO

Representatives of CRIM's four R&D teams gave a talk in conjunction with **Techno Career Days**, organized by **TechnoMontreal**. The talk explored the theme of "ITC Professions Helping People" (Montreal, October 22, 2010).

The **Alfresco symposium**, a day-long conference devoted to electronic document management (EDM), attracted more than 155 people hoping to learn more about information management challenges and issues from the perspective of Alfresco software. This was followed by the **EDM symposium**, which drew 120 attendees (Montreal, November 10, 2009 and Quebec City, May 5, 2010).

Dr. Normand Brassard, gynecologist-obstetrician, CHUQ, recipient of the 2009 IT Health Award ▶

FINANCIAL STATEMENTS 2009-2010

REVENUES

Research and development	$ 2 076 280
IT training and transfer centre (CFT)	$ 1 321 754
Software testing and interoperabiilty centre (CTLI)	$ 299 481
Closed captioning (SOVO)	$ 691 978
Strategic guidance group (SAG)	$ 467 560
Members' dues	$ 316 368
Partner businesses	$ 196 976
Baseline agreement with the MDEIE	$ 5 786 468
Three-year IT investment plan (grant)	$ 134 069
Research support program, phase 2 (grant)	$ 60 547
Conferences	$ 379 321
Other	$ 618 938
TOTAL $ 12,349,740	**$ 12 349 740**

EXPENSES

OPERATING EXPENSES		
Salaries and benefits		$ 7 444 731
Fees and additional scholarships		$ 1 312 298
Operating expenses:	• Rent	$ 1 265 126
	• Advertising and promotion	$ 196 803
	• Professional/administrative services	$ 324 871
	• Other	$ 1 243 140
Amortization of capital assets		$ 372 608
TOTAL $12,159,577		**$ 12 159 577**
Excess of revenues over expenses prior to other expenses		$ 190 163
OTHER		
• Write-off of an ISIQ receivable (discontinuance of business)		$ 104 027
• Relocation expenses		$ 188 136
• Restructuring expenses		$ 138 641
Deficiency of revenues over expenses		($ 240 641)

These financial statements cover the period from June 1, 2009 to May 31, 2010.

PUBLICATIONS

Refereed publications

Book (1)

- Black, R., Gagnon, L. Optical Waveguide Modes: Polarization, Coupling, and Symmetry. New York : McGraw-Hill, 2010. 187 p.

Book Chapters (1)

- Boulianne, G., Beaumont, J.F., Boisvert, M., Brousseau, J., Cardinal, P., Chapdelaine, C., Comeau, M., Ouellet, P., Osterrath, F. and Dumouchel, P. "Shadow speaking for real-time closed-captioning of TV broadcasts in French" In Matamala, A., Orero, P. (eds). Listening to Subtitles: Subtitles for the Deaf and Hard of Hearing Bern, Berlin, Bruxelles, Frankfurt am Main, New York, Oxford, Wien: Peter Lang Publishing Group, 2010.

Journals (5)

- Gagnon, L., Foucher, S., Héritier, M., Lalonde, M., Byrns, D., Chapdelaine, C., Turner, J., Mathieu, S., Laurendeau, D., Nguyen, N. T. and Ouellet, D. "Towards computer vision software tools to increase production and accessibility of video description for people with vision loss" Universal Access in the Information Society, 8 (3) August 2009: 199-218.
- Gagnon, L., Foucher S. "Segmentation of non-natural objects in landscape images using ridgelet transform" Journal of Electronic Imaging, 18 (2), Apr–June 2009.
- Héritier, M., Gagnon, L. and Foucher, S. "Places Clustering of Full-Length Film Key-Frames Using Latent Aspect Modeling Over SIFT Matches" IEEE Transactions on Circuits and Systems for Video Technology, 19 (6) June 2009: 832-841.
- Ryan, K., Amer, A. and Gagnon, L. "Spatiotemporal Region Enhancement and Merging for Unsupervized Object Segmentation" EURASIP Journal on Image and Video Processing, 2009.
- Simao, A., Petrenko, A. "Fault Coverage-Driven Incremental Test Generation" Computer Journal [Advance Access], 12 August 2009.

Conference, Workshops Proceedings (21)

- Beauchemin, S., Darvish Zadeh Varcheie, P., Gagnon, L., Laurendeau, D., Lavallière, M., Moszkowicz, T., Prel, F. and Teasdale, N. "COBVIS-D: A Computer Vision System for Describing the Cephalo-Ocular Behavior of Drivers in a Driving Simulator" In Proceedings of the 6th International Conference on Image Analysis and Recognition (ICIAR 2009), pp. 604-615. Halifax, Canada, July 6-8, 2009.
- Boroday, S., Petrenko, A. and Ulrich, A. "Implementing MSC Tests with Quiescence Observation" In Proceedings of the 21st IFIP WG 6.1 International Conference on Testing of Software and Communication Systems and 9th International FATES Workshop, pp. 49-65. Eindhoven, The Netherlands, November 2-4, 2009.
- Cardinal, P., Boulianne, G. "Real-Time Correction of Closed-Captions" In Proceedings of the 10th Annual Conference of the International Speech Communication Association (Interspeech 2009), pp. 1447-1450. Brighton, UK, September 6-10, 2009.
- Cardinal, P., Dumouchel, P. and Boulianne, G. "Using Parallel Architectures in Speech Recognition" In Proceedings of the 10th Annual Conference of the International Speech Communication Association (Interspeech 2009), pp. 3039-3042. Brighton, UK, September 6-10, 2009.
- Chapdelaine, C., Foucher, S. and Gagnon, L. "Impact of Gaze Analysis on the Design of a Caption Production Software" In Proceedings of the 13th International Conference on Human-Computer Interaction (HCII 2009), pp. 314-323. San Diego, CA, USA, July 19-24, 2009.
- Chapdelaine, C., Gagnon, L. "Accessible Videodescription On-Demand" In Proceedings of the 11th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS'09). Pittsburgh, PA, USA, October 26-28, 2009.
- Darvish Zadeh Varcheie, P., Gagnon, L. "Lip Tracking Using Adaptive Fuzzy Particle Filter in the Context of Car Driving Simulator under low Contrast Near-Infrared Illumination" In Proceedings of the 35th International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2010). Dallas, TX, USA, March 14-19, 2010.
- Dehak, N., Dehak, R., Kenny, P., Brummer, N., Ouellet, P. and Dumouchel, P. "Support Vector Machines versus Fast Scoring in the Low-Dimensional Total Variability Space for Speaker Verification" In Proceedings of the 10th Annual Conference of the International Speech Communication Association (Interspeech 2009), pp. 1559-1562. Brighton, UK, September 6-10, 2009.
- Dumouchel, P., Dehak, N., Attabi, Y., Dehak, R. and Boufaden, N. "Cepstral and Long-Term Features for Emotion Recognition" In Proceedings of the 10th Annual Conference of the International Speech Communication Association (Interspeech 2009), pp. 344-347. Brighton, UK, September 6-10, 2009.
- Dury, A., Hallal, H. H. and Petrenko, A. "Inferring Behavioural Models from Traces of Business Applications" In Proceedings of the 2009 IEEE International Conference on Web Services, pp. 791-798. Los Angeles, USA, July 6-10, 2009.
- Foucher, S., Lalonde, M. and Gagnon, L. "Automatic scene activity modeling for improving object classification" In Proceedings of the SPIE Defense, Security, and Sensing. Orlando, FL, USA, April 5-9, 2010.
- Gupta, V., Boulianne, G. and Cardinal, P. "Content-Based Audio Copy Detection Using Nearest-Neighbor Mapping" In Proceedings of the 35th International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2010), pp. 261-264. Dallas, Texas, USA, March 14-19, 2010.
- Hallal H., H., Dury, A. and Petrenko, A. "Web-FIM: Automated Framework for the Inference of Business Software Models" In Proceedings of the 2009 IEEE Congress on Services (SERVICES 2009), pp. 130-138. Los Angeles, CA, July 6-10, 2009.
- Héritier, M., Gupta, V., Gagnon, L., Boulianne, G., Foucher, S. and Cardinal, P. "CRIM's Content-Based Copy Detection System for TRECVID" In Proceedings of the NIST TREC Video Retrieval Evaluation Workshop 2009 (TRECVID 2009). Gaithesburg, MD, USA, November 16-17, 2009.
- Lalonde, M., Foucher, S. and Gagnon, L. "Unconstrained License Plate Detection Using the Hausdorff Distance" In Proceedings of the SPIE Defense, Security, and Sensing. Orlando, FL, USA, April 5-9, 2010.
- Ledru, Y., Petrenko, A. and Boroday, S. "Using String Distances for Test Case Prioritisation" In Proceedings of the 24th IEEE/ACM International Conference on Automated Software Engineering (ASE 2009). Auckland, New Zealand, November 16-20, 2009.
- Reddy, A., Rose, R., Safadi, H., Larkin, S. and Boulianne, G. "Incorporating Knowledge of Source Language Text in a System for Dictation of Document Translations" In Proceedings of the Machine Translation Summit XII. Ottawa, ON, Canada, August 26 - September 30, 2009.
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- Rose, R., Norouzian, A., Reddy, A., Coy, A., Gupta, V. and Karafiat, M. "Subword-Based Spoken Term Detection in Audio Course Lectures" In Proceedings of the 35th International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2010), pp. 5282-5285. Dallas, Texas, USA, March 14-19, 2010.
- Simao, A., Petrenko, A. "From Test Purposes to Asynchronous Test Cases" In Proceedings of the 6th Workshop on Advances in Model Based Testing (A-MOST 2010). Paris, France, April 6-10, 2010.
- Simao, A., Petrenko, A. and Yevtushenko, N. "Generating Reduced Tests for FSMs with Extra States" In Proceedings of the 21th IFIP International Conference on Testing of Communicating Systems / 9th International Workshop on Formal Approaches to Testing of Software (TESTCOM/FATES 2009), pp. 129–145. Eindhoven, The Netherlands, November 2-4, 2009.

Non-refereed Publications

Technical Reports (6)

- Boufaden, N. Module d'extraction des entités nommées. Montréal, 2010. 21 p. [CRIM-10/05-04]
- Darvish Zadeh Varcheie, P., Gagnon, L. Progress report of CRIM's activities for the SPEED-Q Project for the periode of April 2009 to March 2010. Montréal, CRIM, 2010. 14 p. [CRIM-10/04-03]
- Héritier, H. Video Summarization: Literature Review. Montréal, CRIM, 2009. 9 p. [CRIM-09/10-01]
- Lemieux, L., Byrns, D. Rapport d'avancement du logiciel CRIM DVD Player – Compte-rendu des travaux d'un stage durant la période de janvier à avril 2010 dans le cadre du projet PATR-VD. Montréal, 2010. 25 p. [CRIM-10-05-05]
- Marchand, S., Chapdelaine, C. et Gagnon, L. Rapport d'avancement du logiciel SmartCaption – Compte-rendu des travaux d'un stage sur les aspects d'architecture et interface durant la période de janvier à avril 2010. Montréal, CRIM, 2010. 25 p. [CRIM-10/04-02]
- Simao, A., Petrenko, A. A Transformational Approach for Asynchronous Test Case Generation from Test Purposes. Montréal, CRIM, 2010. 26 p. [CRIM-10/01-01]

Slideshow (1)

- Fleurant, A.-E., Gouaillier, V. La vidéosurveillance intelligente pour la sécurité des personnes et des lieux : marché et progrès techniques. Montréal, CRIM et Technopôle Défense Sécurité, juin 2009. 52 diapositives.

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This report covers CRIM's fiscal year from June 1, 2009 to May 31, 2010.
French version available upon request.

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